

CLAIMS

1. Airport concrete pavement for aprons, taxiways, hard standings, runway ends for distance of 1,000 ft, and hangar floors as critical areas of airport of the preset strength safety level corresponding to the value of strength safety index β equal at least to about 3, with the thickness determined by results of fatigue analysis which is less by 8-10 % than the thickness of this pavement provided by the current Portland Cement Association design procedure due to more complete utilization of flexural strength of concrete than that provided by the current Portland Cement Association design practice of utilization of this strength for carrying out of fatigue analysis of pavement in the framework of said design procedure or with the use of other methods of fatigue analysis according to the requirements of the customer, more complete utilization of flexural strength of concrete considered as a random value means the use of values of modulus of rupture exceeding the mean value of flexural strength for thickness design of pavement, mix design of concrete of pavement being determined by value of 90-day modulus of rupture (MR) required by the thickness design according to said design procedure, fatigue analysis of pavement is carried out with consecutive use of few 90-day values of modulus of rupture of concrete (MR) considered corresponding to the one value of 28-day specified compressive strength of this concrete f'_c , the least of these few values just corresponding to this value of 28-day specified compressive strength is the value of modulus of rupture (MR) required by the thickness design of this pavement according to said design procedure, any of these few values of modulus of rupture of concrete (MR) can be used for fatigue analysis of pavement if strength safety of this pavement designed with the use of the certain value of safety factor and this value of modulus of rupture corresponds to the preset strength safety of pavement.

2. Concrete pavement of airport critical areas of claim 1 with the thickness determined by results of fatigue analysis, fatigue analysis of pavement regardless of forecast of traffic loads and volumes expected during the pavement's design life should be carried out according to the most detailed version of the current Portland Cement Association design procedure or with the use of other

methods of fatigue analysis according to the requirements of the customer with more complete utilization of flexural strength of concrete considered as a random value than that provided by the current Portland Cement Association design practice of utilization of this strength by the consecutive use of three values of 90-day modulus of rupture of concrete (MR) with the difference of 50 psi, the least of these three values of modulus of rupture is the value of modulus of rupture (MR) required by thickness design of this pavement according to the current Portland Cement Association thickness design procedure, any of these three value of modulus of rupture of concrete (MR) can be used for fatigue analysis of claimed pavement if estimation of strength safety of this pavement designed with the use of the certain value of safety factor and this value of modulus of rupture corresponds to the value of strength safety index β equal at least to about 3, sufficiency of thickness of pavement determined regardless of fatigue effect with the use of the values of safety factor in the range from 1.7 to 2.0 with more complete utilization of flexural strength of concrete considered as a random value than that provided by the current Portland Cement Association design practice of utilization of this strength should be checked by results of fatigue analysis of this pavement.

3. Airport concrete pavement for runways (central portion) and some high-speed exit taxiways as noncritical areas of airport of the preset strength safety level corresponding to value of strength safety index β equal at least to about 2.5 with the thickness determined by results of fatigue analysis which is less by 5-10 % than the thickness of this pavement provided by the current Portland Cement Association design procedure due to more complete utilization of flexural strength of concrete than that provided by the current Portland Cement Association design practice of utilization of this strength for carrying out of fatigue analysis of pavement in the framework of said design procedure or with the use of other methods of fatigue analysis according to the requirements of the customer, more complete utilization of flexural strength of concrete considered as a random value means the use of values of modulus of rupture exceeding the mean value of flexural strength for thickness design of pavement, mix design of concrete of pavement being determined by value of the 90-day modulus of rupture (MR)

required by the thickness design according to said design procedure, fatigue analysis of pavement is carried out with consecutive use of few 90-day values of modulus of rupture of concrete (MR) considered corresponding to the one value of 28-day specified compressive strength of this concrete f'_c , the least of these few values just corresponding to this value of 28-day specified compressive strength is the value of modulus of rupture (MR) required by thickness design of this pavement according to said design procedure, any of these few values of modulus of rupture of concrete (MR) can be used for fatigue analysis of pavement if strength safety of this pavement designed with the use of the certain value of safety factor and this value of modulus of rupture corresponds to the preset strength safety of pavement.

4. Airport concrete pavement of claim 3 of noncritical areas with the thickness determined by results of fatigue analysis, fatigue analysis of pavement fatigue analysis of pavement regardless of forecast of traffic loads and volumes expected during the pavement's design life should be carried out according to the most detailed version of the current Portland Cement Association design procedure or with the use of other methods of fatigue analysis according to the requirements of the customer with more complete utilization of flexural strength of concrete considered as a random value than that provided by the current Portland Cement Association design practice of utilization of this strength by the consecutive use of three values of 90-day modulus of rupture of concrete (MR) with the difference of 50 psi, the least of these three values of modulus of rupture considered as specified flexural strength of concrete is the value of modulus of rupture (MR) required by thickness design of this pavement according to the current Portland Cement Association thickness design procedure, any of these three value of modulus of rupture of concrete (MR) can be used for fatigue analysis of claimed pavement if estimation of strength safety of this pavement designed with the use of the certain value of safety factor and this value of modulus of rupture corresponds to the value of strength safety index β equal at least to about 2.5, sufficiency of thickness of pavement determined regardless of fatigue effect with the use of the values of safety factor the range from 1.5 to 1.7 with more complete utilization of flexural

strength of concrete considered as a random value than that provided by the current Portland Cement Association design practice of utilization of this strength should be checked by results of fatigue analysis of this pavement.

5. Existing airport concrete pavement with the estimation of capacity provided according to the current Portland Cement Association design practice of utilization of flexural strength of concrete, more complete utilization of flexural strength of concrete considered as a random value expressed by the use of values of modulus of rupture exceeding the mean value of flexural strength for fatigue analysis of pavement means the revaluation of estimations of strength safety and fatigue strength of this pavement with the corresponding increase of allowable aircraft loads, fatigue analysis of pavement should be carried out according to the most detailed version of the current Portland Cement Association design procedure or with the use of other methods of fatigue analysis according to the requirements of the customer with the consecutive use of three values of modulus of rupture of concrete (MR) with the difference of 50 psi, the least of these three values of modulus of rupture of concrete is the value of modulus of rupture (MR) corresponding to the mean value of flexural strength of concrete, any of these three value of modulus of rupture of concrete (MR) can be used for fatigue analysis of this pavement if estimation of strength safety of this pavement designed with the use of the certain value of safety factor and this value of modulus of rupture corresponds to preset strength safety level of this pavement.